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中国蕨类植物科属的系统排列和历史来源(续)

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THE CHINESE FERN FAMILIES AND GENERA: SYSTEMATIC ARRANGEMENT AND HISTORICAL ORIGIN (*Cont.*)

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六、新分类群的特征简介

Diagnoses of new taxa included in the present paper

实蕨科 新科

Bolbitidaceae (Pichi Sermolli) Ching, fam. nov.

Lomariopsidaceae trib. *Bolbitideae* Pichi Sermolli in Webbia **23**: 381. 1969.

Filices mediocres haud alte scandentes determinate auctae. Rhizoma crassum breviter repens dorsi-ventrale in terra vel in rupium fissuris vel raro inter saxa in alveo rivulorum radicans, rarissime in ima basi arborum truncorum breviter scandens. Frondes approximatae dimorphae ("bathypyllus" semper destitutus), sed juvenes adultis conformae, pinnatae vel raro simplices integraeque apice saepe gemiferae et radicantes, pinnis basi cum rachi continuis haud articu latis. Chromosomata: x = 41.

Typus: **Bolbitis** Schott, Gen. Fil. ad t. 13. 1834.

3 genera pantropica praecipue in Asia et Polynesia late dispersa.

本新科是从藤蕨科分立出来的,它不同于藤蕨科在于植物中小形,根状茎粗短横卧或略匍匐,有限生长,不高攀树干上,叶近生或几簇生,二型,幼叶与成长的叶同形, 羽状, 少为单叶,顶端通常具一芽胞并生根行无性繁殖,羽片基部不以关节着生于叶轴。

植株中小形,有限生长。根状茎粗短,横卧,有腹背结构,生于土中,石上, 溪边, 偶有水生,极少攀援树干基部,鳞片阔, 略呈网状。叶近簇生, 二型(幼叶和成长叶同形, 有长柄),单叶或大都为一回羽状,顶部有芽孢,着地生根成新植株,羽片不以关节着生于叶轴,不育的羽片较宽,无柄或几无柄,全缘、波状或为浅羽裂(在 Egenolfia 属,缺刻内有1个芒刺),主脉明显,两侧小脉分离(在 Egenolfia 属)或为多样的网结,在侧脉间形成多行的拱形网眼,通常不具内藏小脉。能育叶较高而狭,柄较长, 羽片较小、孢子囊褐棕色, 满布羽片下面。孢子两面型,有翅状周壁。

3属,约90种,分布于世界热带,主产亚洲和大洋洲岛屿(Egnolfia 仅产亚洲, Edanyoa

Copel. 仅产菲律宾)。

稀子蕨科　新科

Monachosoraceae Ching in Sunyatsenia **5**:241. 1940, nomen seminudum.

Filices terrestres umbrosae, rhizomate breve adscendente dictyostelico, paleis et pilis veris carentibus apice et partibus juvenalibus excretione mucis piliformibus 2—3-cellularibus clavatis fugaceis ("*pilis monachosorioideis*") abunde obtectae. Frondes caespitosae textura membranceae in sicco semper fuscescentes vel fuscovirides; stipite herbaceo viridi in sicco fuscescente, rachi saepe gemmifero, fasciculis vascularibus duobus sursum in U-formam coalitis praedito; lamina ampla deltoidea subtiliter 3—4-pinnata vel angustate lanceolata et simpliciter pinnata, "pilis" glanduliferibus iis stipitium similibus ubique sparce conspersa sed haud vere pubescente, segmentis ultmis parvis, uninerviis basi inaequalibus; venis liberis anadromicis apice margines non attingentibus. Sori subterminaliter in venulis positi parvi rotundi exindusiati e sporangiis paucis subsessilibus pedicellis brevibus glanduliferibus praeditis compositi. Sporae minutae triquestres triletes transparantae laeves exosporio paulo tuberculoso sine perisporio. Chromosomata x = 7, (28).

Typus: *Monachosorum* Kunze in Bot. Zeit. **6**:119. 1848.

Distributio: China, Japonia, India, Indo-China, Papau, Indonesia.

科的中文描述见中国植物志 2 卷 250 页。

A unique family with two genera of uncertain systematic position. G. B. Nair and U. Sen (in Annales of Botany **38**(156):419. 1974) have made a detailed morphological and anatomical study of the Himalayan *Monachosorum "subdigitatum"* (which in fact is *M. davallioides* Kunze) and revealed a number of additional unique characters of primitive nature not found in the Leptosporangiate Ferns before. These authors concluded that the fern in question must constitute a distinct family, although related in a few minor aspects to the *Dennstaedtiaceae, Thelypteridaceae* and *Davalliaceae.*

睫毛蕨科　新科

Pleurosoriopsidaceae Kurata et Ikebe in Journ. Jap. Bot. **52**(2): 18. 1977, nomen nudum.

Filix pusila epiphytica vel petrophila. Rhizoma tenue late repens fasciculis vascularibus duobus sectione subovatis oppositis praeditum, pilis filiformibus longissimis unicellularibus rufobrunneis patentibus dense obtectum ad apicem praeterea paleis parvis angustis coronatum similiter sparse pilosis. Frondes inter se valde remotae parvae ca. 4—10 cm longae petiolatae, stipite gracili stramineo similiter dense piloso fasciculo vasculari singulo, lamina lanceolata usque 6 cm longa 1—2 cm lata bipinnata utraque facie pilis brevibus multicellularibus pallidis dense pubescenti margine dense ciliata, pinnulis ultimis parvis ligulatis integris uninerviis, nervo simplici marginem haud attingente. Sori lineares crassi exindusiati totam longitudinem venarum occupantes.

Sporae bilaterales reniformes laeves transparentes sine perisporio. Chromosomata x = 36.

Typus: *Pleurosoriopsis* Fomin in Bull. Jard. Bot. Kieff **11**:8. 1929.

Familia monotypica insolita in Asia orient. et bor.-orient. reperta.

Kurita and Ikebe (l.c. 39—48) have discussed the peculiar fern, *Pleurosoriopsis makinoi* (Maxim.) Fomin at length, comparing with both the *Polypodiaceae* and *Aspleniaceae*, and concluded to set up a family of its own. I concur with this view, because its affinity with the *Polypodiaceae* is very unlikely, while with the *Aspleniaceae* is closer, but also differs in many essential characters as diagnosed above. While proposing the new family, *Pleurosoriopsidaceae*, the two authors, however, failed to provide a diagnosis in Latin in order to make the family name valid according to the rules of nomenclature.

植株细小，附生或石生。根状茎纤细，长而横走，有两条左右排列的维管束，横断面呈卵圆形，表面密被极长（1—3毫米）而开展的单细胞、红棕色的线形毛，近顶部还被有狭长鳞片，其基部也具有一些同样的毛。叶远生，小，长4—10厘米，有柄，柄纤细，禾杆色，密被和根茎同样的毛，有圆柱状维管束1条；叶片披针形，长达6厘米，宽1—2厘米，二回羽状，两面密被多细胞的短毛，边缘有密睫毛；小羽片近舌形，全缘，有，条叶脉，不达叶边。孢子囊群粗线形，无盖，生于叶脉的全长。孢子两面型，肾形，透明，平滑，不具周壁。染色体 X = 36。

一个特出的单属的科，分布于亚洲东部和东北部，向西到我国陕西和四川（峨眉山）。

日本植物学家栗田子郎（Kurita）和池部千贺子（Ikebe）在文章中详细而深入地讨论了睫毛蕨这一突出的蕨类植物并反复地与水龙骨科和铁角蕨科在形态解剖和细胞以及原叶体方面进行了比较，认为亲缘关系都不太密切，应成为一个独立的科，睫毛蕨科。我同意他们的观点。他们没有提供必要的拉丁文描述，我在此加以补充，以便使科名有效化。

光叶藤蕨科 新科

Stenochlaenaceae Ching, fam. nov.

Filices magnae alte scandentes, rhizomate longo crasso radialiter terete glabro apice paleis fuscobrunneis fere orbicularibus dense imbricatis obtectae, fasciculibus vasorum numerosis (usque 40) in cyclis tribus positae. Frondes valde dissitae dimorphae plerumque pinnatae; pinnis pluribus lateralibus cum rachi articulatis, pinna terminali ambitu simili sed basi non articulata, pinnis frondis sterilis anguste ellipticis coriaceis facie utraque nitidis glabris margine acute cartilagineo-serratis margine ad basin acroscopicam glande singula praeditis, costulis, lateralibus nullis. Venae secus costas pinnarum areolas angustas elongatas uniseriatas formantes, venis exterioribus densis liberis oblique patentibus simplicibus. Pinnae frondis fertilis valde contractae lineares integrae margine paulo reflexae; soris exindusiatis totam faciem inferiorem tegentibus, paraphysibus nullis. Sporae monoletes transparentes tuberculosae sine perisporio. Chromosomata: x = 37.

Typus: *Stenochlaena* J. Smith in Journ. Bot. **3**:401. 1841.

Familia monotypica incertae sedis, in Asia et Africa tropicta ccurrit.

Up to now the genus *Stenochlaena* has been remaining uncertain as to its systematic position. By Copeland it was placed in the family *Blechnaceae,* while by other authors in the *Pteridaceae.* Because of its peculiar stelar type, indefinite growth, different chromosome number, etc., I prefer to segregate it from both families as an independent family by itself and place it near *Acrostichaceae* to which it is related by several characters, as pointed out by Holttum (Ferns of Malaya p. 411. 1954).

高大攀援植物。根状茎粗壮，圆柱形，光滑，顶端具有褐色、近圆形的覆瓦状鳞片，维管束极多(达40条)，排列成3圈，内圈的较粗。叶远生，二型，通常羽状；羽片多数，侧生的以关节着生于叶轴，顶生的一片圆形，但不具关节；不育叶的羽片狭，椭圆状披针形，表面光滑，有光泽，革质，边缘具软骨质的尖锯齿，近轴的基部具一腺体，两侧不具主脉，叶脉纤细，沿中肋两侧各成1行狭长的网眼，外侧的叶脉分离，密而斜展，单一，能育叶的羽片线形，全缘，边缘稍反卷，孢子囊满布叶下面，无隔丝。孢子两面型，单槽，透明，无周壁，具瘤状突起。染色体 X = 37。

单属的科，分类位置未定，有8种，分布亚洲和非洲热带。

长期以来，光叶藤蕨属的分类位置未能确定，有时归入乌毛蕨科，有时归入凤尾蕨科，但都欠恰当，它是一个孤立的群，应给以科的等级为宜。

槲蕨科　新科

Drynariaceae Ching, fam nov.

Instar *Polypodiacearum* recedit rhizomate valde crasso carnosoque, dictyostelo perforato meristelibus medullaribus numerosis parvisque in circulos duos dispositis, quibus cum meristelibus dorsalibus dictyostelicum irregulariter conjunctis praeditis, fasciculis scleroticis nullis, paleis magnis firmis opacis haud clathratis e basibus orbicularibus peltato-affixis anguste attenuatis margine ciliato-dentatis densissime imbricato; frondibus magnis, rigide erectis, basi ad rhizomatem non vel haud functionaliter articulatis, dimorphis, i.e. praeter folia normalia majores etiam foliis sterilibus brevioribus basalibus pro collectione humi extantibus vel foliis normalibus partibus basalibus brunneis durissime coriaceis valde dilatatis auriculiformibus praeditis; lamina pinnatifida raro pinnata, pinnis vel segmentis maturitate vel in sicco facile e rhachi totaliter absciccis, nectaribus vel glandibus prominentibus in axillis venarum lateralium aut ad petiolos pinnarum saepe praeditis, textura rigide coriacea, plerumque glabra, vel hirsuta, venatione drynarioideis, i.e. venis primariis, secundariis tertiariisque omnibus crassis prominentibusque inter se areolas quadratas distinctas venulis liberis inclusis praeditis formantibus; soris exindusiatis seu parvis in venulis inclusis dorsalibus vel interdum compitalibus, seu magnis plus minus secus venulas vel inter venulas excurrentibus dispositis; sporangiis polypodioideis; sporis ellipsoideis monoletis psilatis vel raro tuber-

culosis (*Aglaomorpha*).

Typus: *Drynaria* (Bory) J. Smith in Journ. Bot. 4:60. 1841.

Ad hanc familiam 8 genera pertinentes, i.e. *Drynaria* (Bory) J. Sm., *Photinopteris* J. Sm., *Merithosorus* Copel., *Thayeria* Copel., *Holostachyum* (Copel.) Ching, *Aglaomorpha* Schott, *Pseudodrynaria* C. Chr. ex Ching, *Drynariopsis* (Copel.) Ching, Asiae tropicae, Malesiae, Polynesiae incolae.

Drynariaceae, a very natural and distinct family, is very closely related, in the type of venation, to the *Dipteridaceae* on the one hand, and to the *Polypodiaceae,* especially to *Microsorium* (e.g. *M. musifolium* (Bl.) Ching) on the other hand, with the latter the family is further related by the broad auricled sessile frond-base, but differs from both in many other essential characters as diagnosed above. In the fern literature the genus *Drynaria* and its allies have heretofore been always considered as a highly specialized group of the polypodioid ferns and were not segregated as a distinct taxon in my revision of the family "Polypodiaceae" (1940). Since then many pteridologists, especially Copeland (Genera Filicum, 1947) and Holttum (Ferns of Malaya, 1954) observed this group of ferns rather in detail and have come to the same conclusion that this group of ferns, because of the similarities in frond-form and venation to *Microsorium musifolium,* may be derived from *Microsorium* Link; but, in my mind, these similarities may perhaps be the result of convergent evolution or indicate a common ancestry, for *Drynariaceae* differs from the *Polypodiaceae* in many other important characters and also, no doubt, is much more primitive and yet more specialized in life-form than the *Polypodiaceae.* Within the group the process of evolution seems still very active, as clearly illustrated by the probable newness and the extreme plasticity of members of the group with a marked tendency towards dimorphism ranging from part fronds to the entire vegetative and reproductive fronds of *Drynaria,* which may be considered as the most advanced of the group. Thus we may see in Pichi Sermolli's order *Polypodiales* the existance of a fairly continuous phyletic line of descent starting from the *Dipteridaceae,* whose ancestral stock has already been found in the Meso zoic fossil ferns, through the *Cheiropleuriaceae* and *Drynariaceae* to the *Polypodiaceae* of to-day.

粗壮的大中形附生植物。根状茎横生，粗肥，肉质，内有一圈穿孔的网状中柱，在其中还有两圈由一些髓分生组织组成的中柱体，它们和网状中柱腹部的分生组织为不规则的结合，不具厚壁组织，密被鳞片；鳞片通常大，狭长，基部盾状着生，深色至褐棕色，不透明，中部细胞具加厚隆起的细胞壁，不为明显的筛孔状，边缘有睫毛状锯齿。叶近生或疏生，无柄或有短柄，基部不以关节着生于根状茎上(有时有关节的痕迹，但完全无功能)；叶片通常大，长圆形，坚革质或纸质，滑润，通常光滑，深羽裂或羽状，二型(如槲蕨属 Drynaria)或一型而基部膨大成阔耳形，棕色，以积聚腐殖质，向上部为正常的营养叶；在二型叶的属中，叶分两种，一种为大而正常的营养和孢子叶，有柄，一种为短而基生的、坚硬的干膜质、

灰棕色(有时淡绿色)、无柄而通常不育的叶，叫做腐殖质的积聚叶 (Humus-collecting leaves)；羽片或裂片以关节着生于叶轴，老时或干时全部脱落，羽柄或主脉的腋间往往具有腺体。叶脉为槲蕨型 (drynarioid venation) 即一回、二回、三回叶脉粗而隆起，明显，彼此以直角相连，形成大小四方形的网眼，小网眼内有少数分离小脉。孢子囊群或大或小，如为小点形，则生于小网眼内的分离小脉上，有时生于几条小脉的交结点上；如为大形，则孢子囊群多少沿叶脉扩展成长形或生于两脉间，不具囊群盖，也无夹丝；孢子囊为水龙骨型，环带由 11—16 个加厚细胞组成；孢子为水龙骨型；原叶体表面除生出多细胞的分枝毛外，还有粗筛孔状的鳞片，染色体 2n = 72, 74。

有 8 属，分布于亚洲热带、马来西亚、玻里尼西亚、菲律宾至澳大利亚(昆士兰)。除槲蕨属有 20 余种外，其余大都为单种的属，其形态变异很大而奇特。中国有 3 属，即 *Drynaris* J. Sm. 产长江以南各省，向西到西藏，向北到秦岭，*Pseudodrynaria* C. Chr. ex Ching 产广东、广西南部、云南东南部，和 *Aglaomorpha* Schott 仅产台湾。

烟斗蕨属　新属

Emodiopteris Ching et S. K. Wu, gen. nov.

Dicksonia Hooker, *Dennstaedtia* J. Smith, *Patania* Beddome.

Genus novum ex affinitate *Dennstaedtiae* Bernh. a qua differt rhizomate cylindrico erectoque, frondibus fasciculatis, lamina ambitu lanceolata basin verus gradatim angustata, pinnis lateralibus lineari-lanceolatis numerosis (30—45-jugis) oppositis contiguis patentibusque deorsum gradatim abbreviatis basi aequilateralibus, pinnulis numerosis (20—25-jugis) patentibus basi aequilateralibus sessilibus apice obtusis pectinato-pinnatifidis, segmentis linearibus 7—9-jugis integris (inferioribus 2—3-furcatis) acutis uninerviis, soris globosis in apice segmentorum singulariter terminatis, indusiis cylindriformibus deorsum recte recurvatis, sporis triletes sphaericis opacis facie grosse verruculosis. Chromosomata 2n = 120.

Typus generis: *Dennstaedtia appendiculata* (Wall. ex Hook.) J. Smith, Hist. Fil. 265. 1875 = **Emodiopteris appendiculata** (Wall. ex Hook.) Ching et S. K. Wu, comb. nov.

2 species in Himalaya et Szechuan repertae.

本新属不同于碗蕨属 (*Dennstaedtia* Bernh.)在于根状茎圆柱形，直立，叶簇生，披针形，二回羽状，羽片披针形，多数 (30—45 对)，密接，下部的逐渐缩短(长约 6—5 厘米)，中部羽片长达 13 厘米，基部宽 2—3 厘米，对称，线状披针形，篦齿状羽裂，小羽片彼此密接，也为篦齿状深羽裂，末回裂片披针形，全缘(或下部的通常 2—3 裂)每裂片具一条叶脉；孢子囊群圆形，生裂片顶端，囊群盖圆筒形，顶生，每裂片一个，向下反折；孢子圆球形，四面型，不透明，表面有粗疣状突起。

2 种，产喜马拉雅南坡温暖杂木林中，向东至四川西南部。

龙津蕨属　新属

Mesopteris Ching, gen. nov.

Genus novum ex affinitate *Pseudocyclosori* Ching sed differt rhizomate late

repente, crasso, lignoso, nudo cum basi stipitis paleis lanceolatis, acuminatis, fusco-brunneis glabris, cellulis elongatis constitutis vestito; tota planta nuda pilis thelypteroideis et pneumatophoriis totaliter carentibus; frondibus magnis, paucis, remote distantibus, lamina ampla, 50—80 cm longa, pinnato-pinnatifida, pinna terminali libera, magnitudine inferiores fere aequante, pinnis numerosis, ad 30-jugatis, ad 40 cm longis, 2 cm latis, facie inferiore glandulis minutissimis globosis sessilibus aurantiaceis plus minus conspersa; venis in segmentis liberis, simplicibus, erecto-obliquis, inferioribus 2½-jugatis adscendentibus et convergenter ad sinus membranam currentibus haud conniventibus sed semper omnibus inter se liberis; sinus membrana inter segmenta pinnarum bene evoluta, elongata et apice callosa, forniculata prominente procurrente; textura folii rigide chartacea in sicco fusco-brunnescente utraque complete glabra; soris exindusiatis, sat magnis, rotundatis, in utroque costae latere irregulariter 1—5 seriatim dispositis in dorso supra basin venarum prope costam sitis, venis sequentibus plerumque sterilibus; sporangiis glabris.

Typus: **Mesopteris tonkinensis** (C. Chr.) Ching (*Dryopteris tonkinensis* C. Chr.)

Genus monotypicum in prov. Kwangsi Chinae et Vietnam bor. incola.

Mesopteris tonkinensis (C. Chr.) Ching, comb. nov.

Dryopteris tonkinensis C. Chr. Bull. Mus. Paris. sér. 2, **6**:103. 1934; Ind. Fil. Suppl. **3**:100. 1934. *Thelypteris tonkinensis* Ching, Bull. Fan. Mem. Inst. Biol. **5**:292. 1936; Tard. Blot et C. Chr. Fl. Gén. Indo-Chine **7**(2):370. 1941. *Amphineuron tonkinense* Holttum, Kew Bull. **3**(2):293—339. 1976.

本新属近于假毛蕨属(Pseudocyclosorus Ching),但有以下许多特点：植物全体无毛，根状茎长而横走，粗约1厘米，木质，连同叶柄基部密被鳞片，鳞片褐棕色，长披针形，全缘，光滑，由狭长的细胞组成；叶柄粗壮，近四角形，基部以上光滑，不具瘤状气囊体；叶片大，稀疏，远生，长50—80厘米，奇数二回羽状半裂，顶生羽片和其下侧生羽片几同形同大，有柄，侧生羽片多达30对，长达30—40厘米，宽达2厘米，羽状半裂，下面多少有微细的金色、球形、无柄腺体散生；裂片尖头，有叶脉8—10对，单一，极斜向上，下部2½对以高的尖三角形斜升达缺刻内的半透明膜，但从不靠合，彼此都分开，缺刻膜发达，伸长，顶部在叶下面伸出成一胼胝质的拱形坚硬突起；叶干后坚纸质，褐棕色，两面极光滑；孢子囊群无盖，颇大，圆形，在羽轴两侧至少排成1行，生于裂片基部一对叶脉的近基部，靠近羽轴，或往往为不规则的2—5行；上部的叶脉全部不育；孢子囊光滑无毛。

一个单种属，产我国广西南部(龙津)。越南北部也有之。生雨林中。

玉龙蕨属 新属

Sorolepidium Christ, emend. Ching

Christ in Bot. Gaz. **51**:350. cum fig. 1911.

Genus glaciale adspectu *Polystichi* (e.g. *P. lachenensi* Bedd.), differt tota planta ubique densissime paleacea, paleis magnis imbricatis ovatis acuminatisque usque late lanceolatis rufobrunneis vetustate saepe albescentibus margine longe fimbriatis

persistentibus; frondibus dense caespitosis breviter petiolatis, lamina lineari-lanceolata 1—4 cm lata pinnata usque subbipinnata; pinnis oblongis usque ovalibus acutis vel obtusis basi aequalibus margine crenatis usque profunde pinnatifidis dentibus aristatis destitutis cartilagineis vel submembranaceis a initio semper reflexis vel valde recurvatis, facie inferiore paleis iis racheos similibus magnis late lanceolatis margine fimbriatis imbricatim obtectis, superiore paleis fibrillosis usque lanceolatis ciliatis adpressis vestitis; venis liberis simplicibus; soris exindusiatis rotundatis in venulis apicalibus utraque costae latere uniseriatis saepe paleis plus minusve occultis.

Typus generis: *Sorolepidium glaciale* Christ

4 species in montibus aplinis usque 4700 m. s.m. in fissuris rupium glacialium Chinae occidentalis (Yunnan, Szechuan et Tibet) crescentes.

The original diagnosis of this distinct Chinese genus by Christ is very misleading and must be revised. He mistook the characteristic scales covering or rather hidding the sori for indusia, hence the generic name. Besides the characteristic scales covering the plant body, the genus further differs from the small alpine *Polystichum* (e.g. *P. lachenense* Bedd.) in the cartilagineous and reflexed margin of the pinnae without aristate teeth and the exindusiate sori hidden among the large scales and more or less spreading upon maturity.

生于高山冰川孔穴内的一个小形蕨属，形体颇似耳蕨（例如 *Polystichum lachenense* Bedd.），但很不相同。遍体密被鳞片，鳞片覆瓦状排列，大，卵形，渐尖头或阔披针形，红棕色，老时往往为苍白色，边缘有长睫毛或流苏状；叶密簇生，具短柄，叶片线状披针形，宽 1—4厘米，一回羽状至二回浅羽裂；羽片长圆形至广卵形，急尖头或钝头，基部对称，边缘全缘或具圆齿或羽裂，不具尖锯齿，软骨质，反折，下面被与叶轴上同样的大鳞片，上面被纤维状或线形贴生的鳞片，老时变苍白色；叶脉分离，侧脉单一；孢子囊群无盖，圆形，顶生于小脉上，在中肋两侧各排成 1 行，通常被鳞片覆盖不见，成熟时往往散开。

本属现有 4 种，仅产云南西北部、四川西部和西藏东南部的 4000—4500 米的高山冰川附近或古代冰斗中。

本属发表于1911年，它的原描述很不正确，必须修正。克利斯特（Christ）把叶下面的鳞片当作囊群盖，这是他认为的本属的特征。他未注意到本属的羽片为全缘或仅有圆钝齿，质薄而反折，植株遍体密被覆瓦状的红棕色大鳞片，边缘为流苏状。孢子囊群无盖，也是本属的一个特征。

单叶双盖蕨属　新属

Triblemma (J. Smith) Ching, gen. nov.

Asplenium sect. *Verum* grex *Triblemma* J. Sm. Ferns Brit. & Fore. 209. 1866.——*Micropodium* J. Sm. Hist. Fil. 323. 1875. non Mett. 1866.

Genus novum proxime affine *Diplazio* Swartz sen. str., sed differt configuratione magis minore, rhizomate tenui longe repente, frondibus inter se valde remotis, lamina lineari-lanceolata simplici integra vel plus minus sinuata, soris more *Diplazii*, sporis

monoletis perisporio angustato transparentibus superficie appendicibus numerosis crassis basilliformibus usque 5.2—13 μ longis apice spinis minutis sparsim armatis instructis. Chromosomatum numerus typi n = 123 (apogamia triploidea), x = 41.

Typus generis: *Asplenium lanceum* Thunberg, Fl. Jap. 333. 1784 = **Triblemma lancea** (Thunb.) Ching, comb. nov.

2 species hactenus cognitis in Asia tropica late dispersis.

J. Smith (Ferns Brit. & Fore. 209) proposed under *Asplenium* sect. *Verum* a *lanceum* group and circumscribed as follows: "Vernation uniserial, sarmentum slender. Fronds distant, linear-lanceolate, 1—1.5 feet long, sori simple, anti or opposite binate (Triblemma)" Besides the difference in habit and leaf-form as pointed out by J. Smith long ago, we have found another striking difference in spore character of *Triblemma* which is quite unique in ferns, and very distinct from *Diplazium* Sw. In frond-form *Diplazium subserratum* (Bl.) Moore is very similar to *Triblemma*, but differs in spores and short-erect rhizome with tufted leaves.

A second species is **Triblemma zeylanica** (Hook.) Ching, comb. nov.——*Asplenium zeylanicum* Hook. Sp. Fil. 3:277. 1870.——*Diplazium zeylanicum* (Hook.) Moore, Ind. Fil. 340. 1862.

本新属的囊群盖的形态同双盖蕨属(*Diplazium* Sw.),但植株形体小而简单,根状茎细长而横走,叶远生,叶片线状披针形,全缘或多少呈波状,孢子也为两面型,但周壁薄而透明,表面具粗棒状突起,高 5.2—13 微米,顶部具有疏的小尖刺,非常特殊。

本属现有 2 种,广布于亚洲热带。

边果蕨属 新属

Craspedosorus Ching et W. M. Chu, gen. nov.

Genus novum criticum, habitu, pinnatione, indumento sorisque cum *Leptogramma* J. Sm. optime congruens, a qua statura multo maiore (ultra 1 m alta), pinnis pluribus (usque 18-jugatis), omnibus praeter supremas liberis haud cum rachi adnatis, utraque fere ad costam pinnatifidis, segmentis margine anguste submembranaceis transparentibusque et minute crenulatis in sicco saepe reflexis, venis simplicibus vel interdum e medio furcatis, apice paulo incrassatis brunnescentibus procul a margine desinentibus, soris oblongis exindusiatisque infra apicem fere prope marginem vel fere medio venae sitis, sporangiis nudis vel interdum apice pilo unico brevi praeditis facile distinguitur.

Typus generis: **Craspedosorus sinensis** Ching et W. M. Chu, sp. nov.

Species unica adhuc cognita in provincia Yunnan Chinae endemica.

中等大的陆生植物。根状茎直立,连同叶柄基部疏被鳞片;鳞片卵状披针形,红棕色,背面密被短糙毛,但边缘不具睫毛。叶簇生,叶柄淡绿色,特别是下部密被有分隔的灰白色、透明针状细长毛;叶片阔披针形,顶部羽裂,向下羽状,分离羽片多对,互生,无柄,披针形,渐尖头,羽裂达羽轴不远处,基部一对几不缩短,羽轴上面有纵沟;叶脉分离,侧脉单一(偶有从中部二分叉的),同假毛蕨属,即基部一对叶脉的上侧一条伸达不具胼胝质的缺

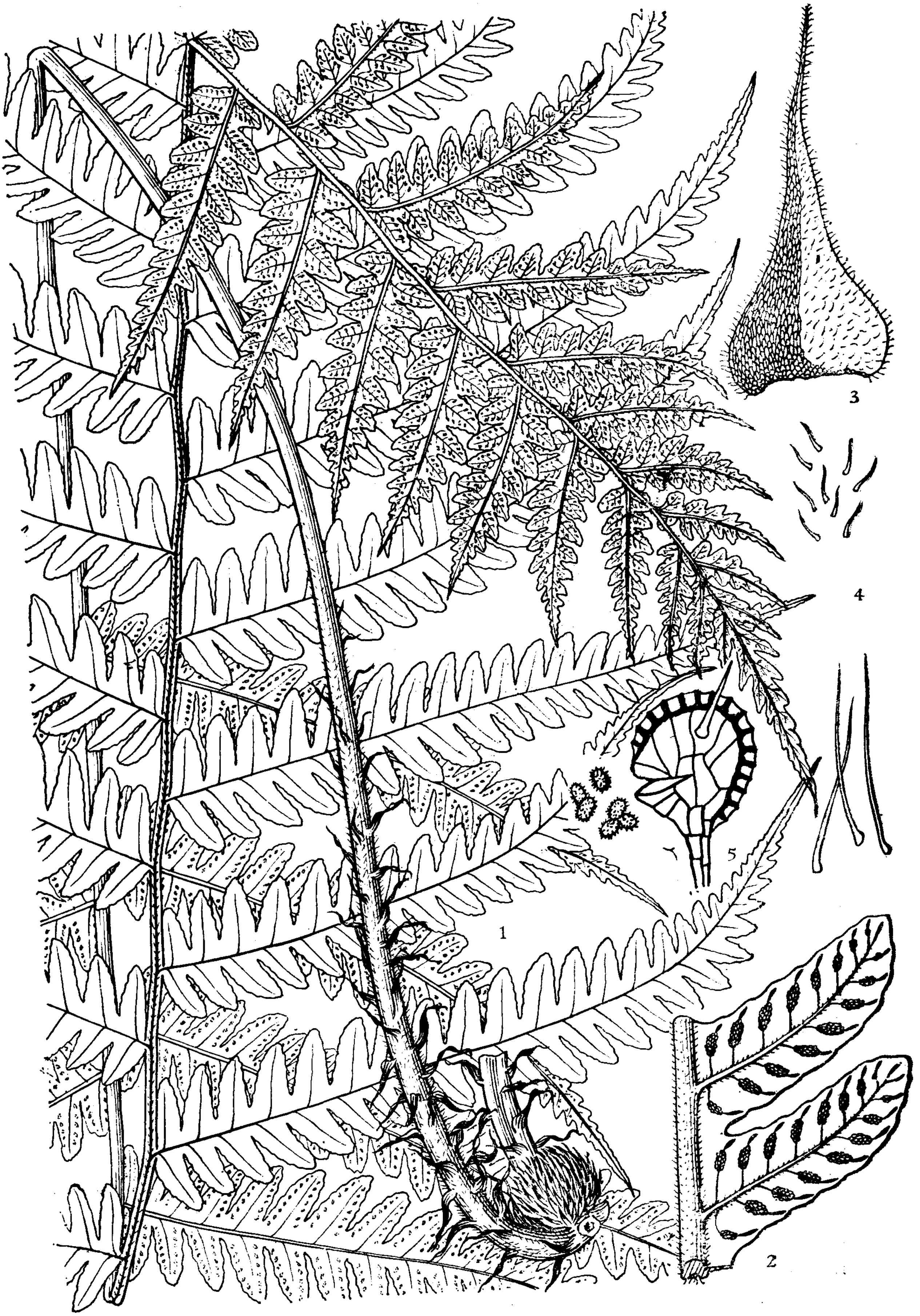

图1 **边果蕨 Craspedosorus sinensis** Ching et W. M. Chu.
1.植株全形,×1; 2.羽片一部分,示叶脉和孢子囊群(放大); 3.鳞片(放大); 4.羽轴上的毛(放大); 5.孢子囊×100。

刻，下侧一条伸达缺刻以上的叶边，叶脉顶端略加粗，都不达叶边。叶草质，绿色，叶轴和羽轴除有针状长刚毛外，还有短糙毛混生。孢子囊群长圆形，无盖，生于叶脉顶端稍下处，较近叶边，主脉两侧留有不育阔空间；孢子囊无毛或有一根短针状毛。

单种的属，产云南东北部（绥江、盐津），是1973年本属第二作者首次发现的。

边果蕨属是金星蕨科的一个细致的新属，与茯蕨属（Leptogramma J. Sm.）的亲缘关系是非常明显的，二者在许多分类学的特征（如形体、分裂式样、叶脉类型、孢子囊群等方面）完全相同，但植株形体远较高大（高达1米余）；羽片较多（达18对），除顶部的外，均与叶轴分离，从不合生，羽状深裂几达羽轴（相距仅2—3毫米）；裂片边缘有半透明的膜质狭边并具微钝齿（往往干后反折不易见）；叶脉单一，少有从中部二分叉，顶部略加粗厚而不达叶边；孢子囊群长圆形，生于叶脉中上部，较近叶边；孢子囊无毛或顶部具1短刚毛。

边果蕨 新种 图 1

Craspedosorus sinensis Ching et W. M. Chu, n. sp. plate 1

Tota planta ad 1.1 m alta; stipite ca. 40 cm longo, 4 mm diametro, virescente stramineo supra basin fere glabro; lamina ca. 65 cm longa, medio ad 22 cm lata, late lanceolata acuminata, basi vix angustata, infra apicem pinnato-pinnatifida; pinnis liberis ca. 25-jugatis, patentibus, alternis, sessilibus, maximis ad 14 cm longis, 2.5 cm latis, lanceolatis, acuminatis, basi rotundatis aequalibusque, ultra 2/3 pinnatifidis; aegmentis usque 20-jugatis, oblique patentibus, 1 cm longis, 5 mm latis, oblongo-lanceolatis, sursum paulo angustatis apice obtusiusculis vel acutiusculis, margine angustissime membranaceis crenulatisque, in sicco reflexis (segmentis infimis in pinnis inferioribus 3—4-jugis paulo abbreviatis); venis in segmentis 5—9-jugis, tenuibus oblique patentibus, simplicibus vel raro e medio furcatis, apice paulo incrassatis, margines non attingentibus; pagina frondis textura in sicco herbacea, viridi, subtus glabra costis costulisque hirsutis exceptis, supra similiter hirsutis, nec non pilis setiformibus sat longis sparsis. Soris oblongis, exindusiatis, uno pro vena margini propiorisinfra spicem venarum sitis; sporangiis glabris vel apice raro pilo unico brevi praeditis.

Yunnan bor.-orient.: Shuikiang, "24 ridges", W. M. Chu (朱维明) 4938 (typus) in shaded place in thickets, alt. 1500 m, 22, V. 1973; Yen-tsing Hsien, Yunnan Bot. Inst. 1208, alt. 1400 m, 24, IX, 1964.

水龙骨属 新属

Polypodiodes Ching, gen. nov.

Genus novum inter *Polypodium* L. (sens. str.) et *Schellolepidem* J. Sm. medium tenens, a priore differt rhizomate fusco vel fuscobrunneo plus minusve pruinoso primo dense paleaceo tum demum infra apicem saepe glabrescenti, paleis fuscobrunneis pulchre iridescentibus cellulibus sat magnis claris fere isodiametricis constitutis, frondibus ambitu oblongis ad alam angustam utraque latere racheos pinnatifidis (vel partibus inferioribus interdum fere ad rachim subpinnatis) venis in ala angustata secus rachim inter costas pinnarum contiguarum unam areolam costalem angustatam continuam (interdum sinu interruptam) exappendiculatam formantibus, venis pinnarum utraque costae latere uniseriatim anasotmosis in quoque areola venula singuli sorifera inclusa praeditis, costis ad insertionem pinnarum inferne paleis iis rhizomatis sed minoribus plerumque conspersis; a *Schellolepide* J. Sm. recedit lamina frondis pinnatifida haud pinnata, pinnis basi rachi adnatis haud articulatis et inter se ala costali angustata areola angustata continua (interdum interrupta) praeditis, soris superficialibus, paraphysibus variis fugaceisque.

Typus generis: *Polypodium amoenum* Wall. ex Mett. Farngatt. Polyp. 80, n. 131. 1857 = **Polypodiodes amoena** (Wall.) Ching, comb. nov.

Ca. 16 species Asiae subtropicae praesertim Himalayae incolae.

水龙骨属不同于多足蕨属 (Polypodium L.) 在于根状茎为黑色或深棕色，通常多少被白粉，顶端以下往往近光滑，鳞片深棕色，透明，具粗筛孔，发出虹光。叶片羽状深裂(不为羽状)；叶脉网结，羽片上的叶脉沿羽轴两侧网结成 1 行网眼，内含 1 条小脉，顶端产生 1 个孢子囊群，网眼外的叶脉分离，达于叶边，沿叶轴两侧的狭翅上的叶脉在各对羽片之间形成 1 个狭长网眼(有时被缺刻切断)，无内藏小脉。

约 16 种，分布于东南亚的亚热带，以喜马拉雅为中心，向东达我国台湾省，日本也有。

下面是一些常见的种类：

Polypodiodes atkinsonii (C. Chr.) Ching, comb. nov.

Polypodium atkinsonii C. Chr. Ind. Fil. 511. 1906.

Polypodiodes lachnopus (Wall.) Ching, comb. nov.

Polypodium lachnopus Wall. ex Hook. Ic. Pl. t. 952. 1854.

Polypodiodes microrhizoma (Clarke) Ching, comb. nov.

Polypodium microrhizoma Clarke in Hook. et Bak. Syn. Fil. 511. 1874.

Polypodiodes nipponica (Mett.) Ching, comb. nov.

Polypodium nipponicum Mett. in Ann. Lugd. Bat. **2**:22. 1866.

Polypodiodes wattii (Bedd.) Ching, comb. nov.

Polypodium nipponicum var. *wattii* Bedd. in Journ. Bot. 1888:235.

Polypodiodes subamoena (Clarke) Ching, comb. nov.

Polypodium subamoenum Clarke in Trans. Linn. Soc. II, Bot. **1**:550, pl. 82, fig. 2. 1880.

Polypodiodes pseudo-amoena (Ching) Ching, comb. nov.

Polypodium pseudo-amoenum Ching in Contr. Nat. Acad. Peiping **2**(3):45. 1933.

Polypodiodes formosana (Bak.) Ching, comb. nov.

Polypodium formosanum Bak. in Journ. Bot. 1885:105.

拟水龙骨属　新属

Polypodiastrum Ching, gen. nov.

Genus novum ex affinitate generis *Schellolepis* J. Sm. (*Goniophlebium* sensu

Copel., non Presl) differt praecipue rhizomate nigro saepe glauco paleis minoribus fuscobrunneis clathratis e basi ovata acuminatis in vetustate delapsis vestito, pinnis lateralibus sessilibus ad rachim haud funcfionalifer articulatis, inferioribus liberis, mediis basi saepe plus minusve adnatis, supremis confluentibus, areolis utraque costae pinnarum uniseriatis majoribusque venula libera inclusis, venis exterioribus liberis vel interdum unam areolam minorem sine venula inclusa formatis, soris superficialibus, haud immersis, paraphysibus triangularibus, peltatis clathratis longe stipulatis fugaceis praeditis.

Typus generis: *Polypodium argutum* Wall. ex Hook. Sp. Fil. **5**:32. 1863. = **Polypodiastrum argutum** (Wall.) Ching, comb. nov.

本新属不同于水龙骨属在于叶片羽状，下部羽片彼此分离，向上的与叶轴合生，近顶部的羽片基部汇合。实际上本属的亲缘更接近于亚洲热带的棱脉蕨属（Shellolepis J. Sm.），但根状茎黑色，侧生羽片不以关节着生于叶轴，下部几对分离的羽片无柄，中部羽片多少与叶轴合生，顶部的几对羽片往往彼此汇合；叶脉在羽轴两侧各形成1行长圆形的大网眼，其长约为羽片宽的2/3，其外侧叶脉分离或偶然形成1个无内藏小脉的小网眼；孢子囊群表面生，在羽片上面不呈乳头状突起。

约8种，分布于喜马拉雅，四川、云南、贵州、广西、台湾；日本、印度支那和大洋洲各有1种。

下面是常见的几个种类：

Polypodiastrum prainii (Bedd.) Ching, comb. nov.

Goniophlebium prainii Bedd. in Journ. Bot. 1893:226.

Polypodiastrum dielseanum (C. Chr.) Ching, comb. nov.

Polypodium dielseanum C. Chr. Ind. Fil. 255. 1906.

Polypodiastrum mengtzeense (Christ) Ching, comb. nov.

Polypodium mengtzeense Christ in Bull. Herb. Boiss. **6**:867. 1898.

Polypodiastrum someyae (Nakai) Ching, comb. nov.

Marginaria someyae Nakai ex H. Ito in Journ. Jap. Bot. **11**:95. 1935.

Polypodiastrum taiwanianum (Hay.) Ching, comb. nov.

Polypodium taiwanianum Hay. in Bot. Mag. Tokyo **23**:8. 1909.

Polypodiastrum molle (**Bedd.**) Ching, comb. nov.

Goniophlebium molle Bedd. Ferns Brit. Ind. t. 206. 1867.

篦齿蕨属 新属

Metapolypodium Ching, gen. nov.

Genus novum *Polypodio* L. (sens. str.) affine, habitu multo graciliore, rhizomate gracili longe repente paleis lanceolatis longe acuminatis clathratis basi pilis longis capilliformibus mollibus rufo-brunneis demum delapsis densissime praeditis sparsim obtecto, frondibus valde dissitis textura tenuiter herbacea, pinnis numerosis (30—55-jugis) pectinnatim recto-patentibus, venis unifurcatis, soris paraphysibus nullis, sporis

exsporis minute verruculosis. Genus ex affinitate *Thylacoperidis* Kze. Asiae tropicae differt soris superficialibus, paleis rhizomatis dorso pilis capiliformibus mollibus dense praeditis.

Typus generis: *Polypodium manmeiense* Christ in Bull. Herb. Boiss. **6**:870. 1898 = **Metapolypodium manmeiense** (Christ) Ching, comb. nov.

篦齿蕨属不同于上面两属之点是：植物形体瘦长软弱；叶为薄草质；羽片上的叶脉分离，简单地二分叉；根状茎细长，鳞片基部具有 1 簇棕色、易落的细柔毛和疏生的叶。本属最近多足蕨属 (Polypodium L.)，叶脉也是分离的，但分枝形式不同，仅是二分叉；植物形体和质地也有差别。

2 种，产我国云南、四川；印度支那、泰国、缅甸、锡金喜马拉雅有 1 种。

金平篦齿蕨　新种

Metapolypodium kingpingense Ching et W. M. Chu, sp. nov.

Species nova adspectu arcte affinis *M. manmeiensi* (Christ) Ching, differt paulo robustiore, lamina ad apicem nec caudata sed acuminata, stipite rachique subtus dilute brunneis nec pallide stramineis, pinnis pluribus (45—55-jugis) paulo latioribus (5 mm latis) apice obtusis, nec acutis, venis furcatis furca basiscopica acroscopicae fere aequilonga recta haud incurvata, soris minoribus.

Yunnan austro-orient.: King-ping, W. M. Chu et al. (朱维明等) 6519 (**typus**) in rupibus, alt. 700 m.

本新种形体极似篦齿蕨 (M. manmeiense (Christ) Ching)，但略较强壮，叶柄和叶轴下面淡棕色，叶片顶端渐尖，羽片较多 (45—55 对)，略较宽 (5 毫米)，顶端钝，二叉叶脉的下侧一脉与上侧一脉几等长，直而不内弯，孢子囊群较小，故易区别。

云南：东南部，金平，苦聪老岭，生石上，海拔 700 米。

七、 Summary

In 1940 I proposed thirty-three groups of related fern genera tentatively described as families in English for the purpose of a general discussion among then pteridologists. As I did not ccnsidered them as would-be families, I never thought of the necessity of their validation[1] by formal latin diagnoses until there would be a general agreement on this subject in the future. I had never thought, however, that a great interest in my proposal could have arisen from pteridologists. Since then new or revised classification systems and phylogenetic schemes of ferns (mostly Leptosporangiatae) were appearing one after another in quick succession. Until now there are at least nine such systems and schemes proposed by various authors. All these systems represent milestones in the history of fern classification. It would be a great mistake, however, to assume that any is final or definitive. There is yet a long way towards a full systematic understanding of such an immensely complicate ancient plant group

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[1] In the early spring 1964 Professor Pechi Sermolli had written a letter requesting me to validate these tentative family names, but I did not do it, because I thought they were yet premature. Since then he was on different occasions validating most of the proposed families.

as Filicopsida.

In the present paper I have tried to make further amendments and improve as much as I can the systematic arrangement of the families and genera of the Chinese Pteridophytes and to bring to light those groups for which more work is much needed. Incidently, I shall also take the liberty of commenting upon other problems on fern classification coming into my notice in literature. In case I am mistaken, I shall gladly accept with gratitude any criticisms.

On the epoch-making work, the *Genera Filicum* by Copeland (1947), I already commented at some length (1954, in Chinese), and there is no necessity to repeat it again here. However, from the existing classification systems and phylogenetic schemes of ferns proposed since 1940, it is quite clear that there is a general awareness on the part of the majority of pteridologists of the composite nature of many classical taxa (both families and gerera) and that, in order to better express the evolutionary trends and interrelationships, to reasonably split these taxa into smaller units is at present apparently the dominant tendency in the field of pteridology. This is, of course, by no means assumed that regression or alternative would be improbable.

Amongst the types of problems we are facing now are: (1) to what extent the composite classic taxa should be subdivided, and (2) how to allocate them (categories of both families and genera) more reasonably in a classification system and phylogenetic scheme. As it stands now, the opinions regarding these problems are yet much divided. This, of course, must be considered as a healthy sign, because they will exert a stimulating effect on the furtherance of our research in many age-old problems, which have challenged and will, no doubt, challenge us in the future.

Speaking more concretely, the first type of problems is chiefly concerned with such families as the *Sinopteridaceae, Athyriaceae, Cyatheaceae, Aspidiaceae, Dryopteridaceae, Hymenophyllaceae, Thelypteridaceas, Polypodiaceae* (particularly the tropical American groups), *Lycopodiaceae* and a few others of less complication, some of which were already proposed by Holttum (1973) as requiring further investigations. The second type of problems largely concerns the *Acrostichaceae, Monochosoraceae, Aspleniaceae, Pleurosoriopsidaceae, Loxogrammaceae, Grammitaceae, Elaphoglossaceae, Taenitidaceae, Blechnaceae, Stenochlaena, Gymnogrammitidaceae* and a few others. Pichi Sermolli (Cystotaxonomical Atlas of the Pteridophytes) has placed these taxa in his newly proposed system, but the places allocated to some of them, in my opinion, are not quite satisfactory, as will presently be noted.

The *Sinopteridaceae* (the Cheilanthoid ferns), for which little systematic work has so far been undertaken, is a taxonomically difficult group with the bonudaries of many genera imperfectly differentiated. The family *Cryptogrammaceae,* as a segregate from the cheilanthoid ferns, construed by Pichi Sermolli (1962) as consisting of three genera, *Cryptogramma, Onychium* and *Llavea,* seem to be not a homogenous taxon. While the first two genera may be remotely related, the monotypic Central American *Llavea* seems to be a genus *incertae sedis.* Even the genus *Onychium* of C. Chr. Ind. Fil. is a heterogenous taxon. Hall and Lellinger (1967) transferred six Chinese and Himalayan species of *Pellaea* into the typically Central American genus *Mildella.* However, our observation shows that the indusium in these Asiatic taxa, unlike the American genus, is truely of marginal origin (very clearly in living state), but their leaf-margin becomes more or less reflexed upon drying. The same situation is also observed in some species of *Onycnium,* e.g. *O. japonicum.* Cheilanthoid ferns as generally circumscribed differ great deal not only in gross morphology, but also in spores as pointed out by Tryon & Tryon (1973). Taxonomically, cheilantnoid ferns require a revision in a world-wide scope. To my best knowledge *Cheilanthes* Sw. has no representative in South-eastern Asia, where the species are better referred to *Cheilosoria* Trev.

The family *Monochosoraceae,* proposed by me in 1940, is uniquely distinct as lately emphasized by Nair and U. Sen (1974). Pichi Sermolli following Holltum (1947) allocated its two genera, *Monochosorum* and *Ptilopteris* to the *Dennstaedtiaceae,* with which this family *incertae sedis,* however, has nothing in common at all. Mickel (1973) advocates its affinity with the aspidioid ferns. This is also very unlikely.

Over the family *Polypodiaceae* a great confusion still reigns in the delimitation of some genera and their geographical distribution. My work (unpubl.) on the polypodioid ferns (sen. str.) has resulted in indicating rather definitely that there are no Neotropical polypodioid genera and their representatives in Southeastern Asia or vice versa. Even the genus *Polypodium* (sen. str.) has no true representatives in Southeastern Asia. It is strictly a temperate northern Eurasian, northeastern Asian and North American genus with, in my mind, about ten species. In tropical and subtropical Asia, the genus *Polypodium* (sen. str.) is replaced by its allies, *Polypodiodes* (based on *Polypodium amoenum* Wall.), *Polypodiastrum* (based on *Polypodium argutum* Wall.), *Schellolepis* (based on *Polypodium subauriculatum* Bl.), *Metapolypodium* (based on *Polypodium manmeiense* Christ) and *Thylacopteris* (based on *Polypodium papillosum* Bl.), all previously referred to *Polypodium* by different authors, of which the last two genera, like *Polypodium vulgare,* also ves free venation but of different type, besides differences in other respects as pointed out above. The Neotropical polypodioid ferns are a taxonomically vexing group to deal with, as recently emphasized by de La Sota (1973). They are phyletically distinct from the polypodioid ferns in South-eastern Asia. As we know now, the two major polypodioid groups have developed independently in their respective areas without mutual relationships.

At present, the *Polypodiaceae,* in my opinion, is still a composite family. Recently, Nayar, (1970) following Copeland, subdivided the *Polypodiaceae* into five subfamilies. I have been inclining to consider the neotropical subfamily *Pleopeltisoideae* a very natural group, susceptible to family rank, because, according to de La Sota (1960, 1973) this subfamily is characterized by pleo- or dictyosori and always sterile costal areoles, to which may also be added the peculiar persistent lamina scales which partially modified as soral "paraphyses". Thus *Lepisorus* and *Pleopeltis* are of distinct phyletic lineage and of different geographic origin. The remaining two subfamilies, *Microsorioideae* and *Crypsinoideae* may perhaps be united. Another group of worldwide distribution, the *Pyrrosia-group,* characterized by a distinct type of venation and stellate-hairy indumentum and, for the latter reason, classified together with the *Platycerioideae* by Nayar (l.c.), is a quite natural group in the polypodioid ferns. Thus delimited, the family *Polypodiaceae,* in my mind, would consist of only *Polypodium, Thylacopteris, Metapolypodium, Polypodiodes, Polypodiastrum, Schellolepis* in the

Old World, and of *Polypodium, Goniophlebium, Marginaria, Synammia, Phleboidum* and few others in the New World. In the present paper the *Drynarioideae* is raised to family rank, *Drynariaceae*. Recently, Pichi Sermolli (1973) has proposed two new generic names of the polypodiaceous ferns, *Phymatosorus* for the classic *Phymatodes* Presl, and *Phymatopteris* for *Phymatopsis* J. Sm. I consider the two new names superfluous. We all know that the type of *Phymatodes* is and must be *Phymatodes vulgaris* Presl, which was *Polypodium phymatodes* L., and now *Phymatodes scolopendria* (Burm.) Ching. *Phymatopsis* J. Sm. is a later homonym of *Phymatopsis* Tulasne ex Trev., an obscure and rejected genus of *Ascomycetes*. *Phymatopsis* J. Sm. has now about 70 species and all have names under the genus. In such a case *Phymatopsis* J. Sm., if necessary, should be conserved to avoid a multiplication of so many new names.

The family *Gymnogrammitidaceae* (Ching, 1966), a peculiar monotypic taxon from Asia mainland, is still dubious as to its systematic position, although I tentatively ranked it with Polypodiaceous ferns. It was since long wrongly associated with the *Davalliaceae*, with which its resemblance is entirely superficial. Sen and Sen (1971) made a morphological study of *G. dareiformis*, but indicated no systematic position, nor is the chromosome count available.

The family *Hymenophyllaceae* requires an overhauling, inspite of the elaborate work by Copeland (1938). Cytologically, many of his genera are heterogenous. In addition, I concur with Holttum (1974) in rejecting *Vandenboschia* Copel. as a synomym of *Trichomanes* L. with *T. scandens* L. as its type species.

The family *Thelypteridaceae* of the Old World has just received a thorough revision by Holttum, resolving a great many long-standing nomenclatural and taxonomical problems. His work is a great advancement over mine. Nevertheless, my impression is that there seems to be too much splitting generically. Some genera such as *Coryphopteris, Trigonospora, Christella* are rather weakly founded, basing upon a single often microscopical character. I prefer to keep the related genera, *Stegnogramma, Leptogramma* and *Dictyocline* apart at least for the sake of convenience. Recently, basing upon African plants, Pichi Sermolli (1970) combined *Pseudophegopteris* to *Macrothelypteris* under the latter genus. I have not seen African plants, and it would be inappropriate for me to make comment on his treatment. As far as the Asiatic plants are concerned, however, I can tell the two genera apart at a glance. C. C. Wood (1973) has shown convincingly that the type of the spores of *Pseudophegopteris* "is not only uniform throughout the group but is also confined to this single group in the *Thelypteridaceae*." The spores in *Macrothelypteris* is entirely different from those of *Pseudophegopteris*. The recently published new genus *Wagneriopteris* Löve et Löve is nothing but *Parathelypteris* with a different chromosome number ($x = 31$), which alone has little weight in the generic delimitation. Chromosome numbers are important taxonomic criteria but must be used in combination with other characters. A genus having species with a series of different chromosome numbers is not of a rare occurence. Long ago Manton and Sledge (1954) already warned against the limitations of the cytological method. *Trichneuron* Ching from the southern part of Yunnan, China, remains a puzzling taxon. It is questionably placed in the *Thelypteridaceae* by me. Pichi Sermolli has of late placed it with the *Athyricaceae*, but this is also unlikely.

The family *Athyriaceae* is another complicate group of ferns and this is especially true in China, Japan and North India where are now recognized over 260 species of the genus *Athyrium* and over 100 species of the genus *Allantodia,* a segregate from *Diplazium.* I did some preliminary classification, but there are more problems to be tackled. Inspite of its seemingly bewildering nature, however, the *Athyriaceae* are doubtlessly a natural family, there being no problem at all in its delimitation from *Aspidiaceae* as suggested by Sledge (1973). We all know that the forms of sori and indusia in *Athyriuaceae* are extremely variable and they alone are no longer a reliable criterion in classification of the genera concerned. *Carpogymia* Löve et Löve is a direct synonym of *Gymnocarpium* by anagram.

The family *Dryopteridaceae* is no doubt one of the largest fern families known, and, like the *Athyriaceae,* its centre of diversification is also in China, Japan and the Himalayas, wherefrom, so far known, the genus *Dryopteris* has more than 300 species, *Polystichum* well over 300 species and *Arachniodes* about 100 species. As construed by me, the family has now 14 genera and all but three occur in Asia mainland, many being endemic in China and the Himalayas. With us the genus *Arachniodes* is a natural one rather than a "genus of convenience" as supposed by Sledge (1973). The *Aspidiaceae* in Pichi Sermolli's classification is construed as covering both the dryopteroid and tectarioid ferns, but, the two families are natural ones as pointed out by me (l.c.).

The controversary family *Peranemaceae,* is no doubt an offshoot of the massive dryopteroid stock. As construed by me (1954), the family is consisting of three closely related genera, *Peranema, Diacalpe,* and *Acrophorus.* Since the time of Mettenius (Fil. Lechl. 2:33. 1859) *Diacalpe* has often been treated as a synonym of *Peranema.* Sledge (1973) has quite recently discussed the status of the two genera at some length. Since long I had often thought about the question raised by Sledge. As *Diacalpe* is then a monotypic genus, its sessile sori might well be considered as a specific distinction. Now I think differently and maintain *Diacalpe* as generically distinct from *Peranema,* because of the fact that the genus now has nine species, while *Peranema* remains with two species.

The genus *Lithostegia,* a monotypic and taxonomically unique taxon, has undergone a great nomenclatural vicissitude since Clarke (Trans. Linn Soc. 11, Bot. 1:434. 1880). In 1963, Nayar, while placing *Diacalpe aspidioides* back in *Peranema,* also reduced *Lithostegia* as a synonym to that genus. This action received support from Sledge. As a matter of fact, *Lithostegia* is in my mind only related to *Arachniodes* in point of leaf architecture (anadromous arrangement of pinnules and venation). But the peculiar lentil-shaped dark-colored bony indusium laterally attached to the veins and splitting into 2—3 lobes finds no parallels in the leptosporangiate ferns.

The family *Cyagheaceae* (sen. str.), whose classification has been variously treated by many pteridologists, especially of late by Holttum and Tryon, remain to be a vexing problem. The criteria (or rather one character-criterion — the stipe-scales) proposed by both authors for generic separation are very subtle. Among the older pteridologists Domin was the most daring one who actually united different genera of the *Cyatheaceae* under one generic name, *Cyathea* (Acta Bot. Boemica 9:85. 1930). For the main subdivision of the Chinese *Cyatheaceae* I am tentatively adopting *Alsophila, Gymnosphaera* and *Sphaeropteris* as three closely related genera pending further study. More new characters for use in subdividing the family are certainly much needed.

Since Rothmaler's work (1944), the family *Lycopodiaceae* (sen. str.) is for the first time receiving a thorough revision by Holub, whose classification is acceptable. I have been adopting his system in my treatment of the asiatic *Lycopodiaceae*. The puzzle of *Lycopodium clavatum* complex in Asia has been unravelled. In Asia *L. clavatum* L. occurs only in the temperate zone of northern Asia (Soviet Union), while in extreme north-eastern Asia the species appears as a different geographical variant. There is no true *Lycopodium clavatum* in central and south-eastern Asia at all. The previous report of this European species therefrom proves now to be largely a mistake for the classical *Lycopodium japonicum* Thunb, which was entirely forgotten since its publication in the *Flora japonica* (1784), probably due to the fact that the type in Thunberg's herbarium represents a sterile specimen.

Pichi Sermolli (Webbia 29:5. 1974), while discussing the status of the genus *Taenitis* and related genera, stated that "they represent an isolated group, which cannot be satisfactorily classified in any of the known families of ferns. Thus the best way and the only solution is to classify *Taenitis* and related genera into a family of its own, rather to unite them unnaturally to one of the previously described families." I concur with this view and likewise, but tentatively, treat some isolated and systematically uncertain Asiatic taxa with family rank pending further study. Thus there is at least one obvious advantage in key-making and idenfification work in comparison with unnaturally large families of discordant elements.

Contrary to Pichi Sermolli's classification, I would, convenationally, prefer to removing the polypodiaceous ferns including *Diperidaceae* and other related families from the proximity of the family *Gleicheniaceae* (from which they are supposed as derived by some authors) and place them next to the davallioid ferns whose relationships with the *Polypodiaceae* are quite apparent in many respects.

There is doubtlessly a great need for a natural classification of orders of Filicopsida, but the trouble is that there are a number of taxa (both genera and families as pointed out above) which are still uncertain as to their systematic status and positions, and such a classification is, therefore, not likely to be a successful one at present, as shown by Pichi Sermolli's sixteen-orders system instead of the generalized conventional four orders.

In conclusion, I would like to comment briefly on the construction of phylogenetic charts of ferns, which is no doubt a very trying, if not well-nigh impossible task for such a tremendous and complicate group of ancient plants on the present level of our knowledge and which is,consequently, bound to be hypothetical or artificial to a great extent. In theory phylogeny is to deal with the interrelationships of plant groups and their evolutionary sequences from their very beginning down to the present day. Since we have little direct evidence concerning the interrelationships of such a vast groups of leptosporangiate ferns available, our present phylogenetic charts or schemes are largely inferred from the criteria of their classification systems, which, in turn, are based on our knowledge of their ontogeny, morphology, cytology, palynology and structure, development and shape of gametophytes and sexual organs. Unfortunately, a great deal of important information of this nature is still lacking at the present time. On the other hand, the complications of reversals and correlated changes in organs and of convergent or parallel evolutionary trends of different organs, with which we are all familiar, have obscuree the true interrelationships of otherwise visually distinct groups. Because of this, there necessarily arise different opinions amongst various authors regarding the relative significance of morphological characters in evaluation of the taxonomical criteria in connection the interpretation of evolutionary trends of certain groups in comparison with other seemingly allied groups. This is perhaps the reason why phylogenetic schemes are more or less different from each other. Amongst such schemes so far proposed, the one by Holttum (1973) and another by J. T. Mickel (1974), though look fragmentary and disconnected, seem to be more plausible than some others (cf. Pichi Sermolli in Jermy et al. ed.: the Phylogeny and Classification of the Ferns 11—30. 1973), which look showy and elaborate but to a great extent are mere naive imagination or speculation, because of the fact that between the major groups there are yet numerous missing links or gaps of varying sizes as indicated by Holttum's and Mickel's schemes, to be filled up before we could have a more intelligent phylogenetic scheme. In fact, our classification system will remain more or less artificial as long as the phylogenetic interpretations of the different fern groups are inferred or sometimes speculated. No system could be accepted as final until the interrelationships of its components are fully known. Thus it is not pretended that the present arrangement is a quite natural system of the Chinese pteridophytic classfication; it is rather meant only as one which demonstrates affinities as much as the present state of our knowledge may permit.

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